Remarks

The final Office Action mailed May 3, 2007 has been carefully reviewed and the foregoing amendment has been made in consequence thereof.

Claims 1-20 are now pending in this application. Claims 1-20 stand rejected.

The rejection of Claims 1, 2, 9-13, 17, and 18 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent 6,628,743 to Drummond in view of U.S. Patent 5,421,331 to Devito is respectfully traversed.

Drummond describes an apparatus used for the acquisition and analysis of cardiac image data. The apparatus includes a medical scanner for generating first and second volumes of cardiac image data in a single exam, and a data acquisition system for acquiring the first and/or second volumes of cardiac image data. An image reconstructor reconstructs a viewable image from the first and/or second volumes of cardiac image data, and a database stores the information from the data acquisition system and the image reconstructor. The apparatus also includes an operator interface for managing the medical scanner, the data acquisition system, the image reconstructor, and/or the database. A computer used with the apparatus includes a post-processing algorithm that analyzes the reconstructed volume of cardiac image data and displays a viewable image. The post-processing algorithm includes instructions for delineating a region of a viewable image representative of the myocardial muscle and/or the left ventricle. The algorithm also includes instructions for volume rendering an image of the myocardial muscle and/or the left ventricle and/or determining an image of a phase of the cardiac cycle representative of the end diastole and/or end systole.

Notably, Drummond does not describe nor suggest selecting an imaging exam configured to produce a 3D dataset representing at least one portion of the heart during at least one phase, and generating, by a processor, a volume of a ventricle of the heart based on the imaging exam selected. Rather, Drummond describes a post-processing algorithm that determines an image of a phase of the cardiac cycle representative of the end diastole and/or end systole. Applicants submit that merely describing a post-processing algorithm that

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determines an image of a phase of the cardiac cycle representative of the end diastole and/or end systole is not descriptive nor suggestive of selecting an imaging exam configured to produce a 3D dataset representing at least one portion of the heart during at least one phase, and generating, by a processor, a volume of a ventricle of the heart based on the imaging exam selected.

Devito describes identifying a long axis of a left ventricle by identifying, and correlating, local minima and maxima in images of slices of the left ventricle. Initially, the left ventricle is identified within a representative transverse slice of the left ventricle. The centerline of this slice is computed and used as a reorientation axis, along which another (sagittal) slice of the left ventricle is reconstructed. The centerline of this sagittal slice is computed to identify the long axis of the left ventricle. Notably, Devito does not describe nor suggest selecting an imaging exam configured to produce a 3D dataset representing at least one portion of the heart during at least one phase, and generating, by a processor, a volume of a ventricle of the heart based on the imaging exam selected.

Claim 1 recites a method for generating views of a heart along anatomically useful planes, wherein the method comprises "selecting an imaging exam configured to produce a 3D dataset representing at least one portion of the heart during at least one phase . . . automatically generating the cardiac 3D dataset . . . calculating, from the cardiac 3D dataset, at least one of a short axis and a long axis without user intervention . . . generating, by a processor, a volume of a ventricle of the heart based on the imaging exam selected, wherein said generating the volume comprises creating the volume by region growing . . . diagnosing the heart by analyzing the volume."

Neither Drummond nor Devito, considered alone or in combination, describes or suggests a method as is recited in Claim 1. More specifically, neither Drummond nor Devito, considered alone or in combination, describes or suggests a method including selecting an imaging exam configured to produce a 3D dataset representing at least one portion of a heart during at least one phase, and generating, by a processor, a volume of a ventricle of the heart based on the imaging exam selected. Rather, Drummond describes a post-processing algorithm that determines an image of a phase of the cardiac cycle representative of the end

diastole and/or end systole, and Devito describes a method of identifying a long axis of a left ventricle. Accordingly, Applicants submit that Claim 1 is patentable over Drummond in view of Devito.

Claims 2 and 9-11 depend from independent Claim 1. When the recitations of Claims 2 and 9-11 are considered in combination with the recitations of Claim 1, Applicants submit that Claims 2 and 9-11 likewise are patentable over Drummond in view of Devito.

Claim 12 recites a computer readable medium encoded with a program executable by a computer for generating views of a heart along anatomically useful planes, wherein the program is configured to instruct the computer to "receive a selection representing an imaging exam configured to produce a 3D dataset representing at least one portion of the heart during at least one phase . . . automatically receive the cardiac 3D dataset representing a portion of the heart . . . calculate, from the cardiac 3D dataset, at least one of a short axis and a long axis without user intervention . . . generate a volume of a ventricle of the heart based on the imaging exam selected, wherein to generate the volume, said program configured to instruct the computer to create the volume by region growing . . . diagnose the heart by analyzing the volume."

Neither Drummond nor Devito, considered alone or in combination, describes or suggests a computer readable medium as is recited in Claim 12. More specifically, neither Drummond nor Devito, considered alone or in combination, describes or suggests a computer readable medium encoded with a program that is configured to instruct a computer to receive a selection representing an imaging exam configured to produce a 3D dataset representing at least one portion of a heart during at least one phase, and generate a volume of a ventricle of the heart based on the imaging exam selected. Rather, Drummond describes a post-processing algorithm that determines an image of a phase of the cardiac cycle representative of the end diastole and/or end systole, and Devito describes a method of identifying a long axis of a left ventricle. Accordingly, Applicants submit that Claim 12 is patentable over Drummond in view of Devito.

Claim 13 depends from independent Claim 12. When the recitations of Claim 13 are considered in combination with the recitations of Claim 12, Applicants submit that Claim 13 likewise is patentable over Drummond in view of Devito.

Claim 17 recites a medical imaging apparatus for generating views of a heart along anatomically useful planes, wherein the medical imaging system apparatus comprises "an imaging system comprising . . . a detector array . . . at least one radiation source . . . a computer coupled to said detector array . . . a workstation coupled to said computer, said workstation configured to . . . receive a selection representing an imaging exam configured to produce a 3D dataset representing at least one portion of the heart during at least one phase . . . . automatically receive the cardiac 3D dataset representing a portion of the heart . . . calculate at least one of a short axis and a long axis without user intervention . . . generate a volume of a ventricle of the heart based on the imaging exam selected, wherein to generate the volume, said workstation configured to create the volume by region growing."

Neither Drummond nor Devito, considered alone or in combination, describes or suggests a medical imaging apparatus as is recited in Claim 17. More specifically, neither Drummond nor Devito, considered alone or in combination, describes or suggests a medical imaging apparatus including a workstation configured to receive a selection representing an imaging exam configured to produce a 3D dataset representing at least one portion of a heart during at least one phase, and generate a volume of a ventricle of the heart based on the imaging exam selected. Rather, Drummond describes a post-processing algorithm that determines an image of a phase of the cardiac cycle representative of the end diastole and/or end systole; and Devito describes a method of identifying a long axis of a left ventricle. Accordingly, Applicants submit that Claim 17 is patentable over Drummond in view of Devito.

Claim 18 depends from independent Claim 17. When the recitations of Claim 18 are considered in combination with the recitations of Claim 17, Applicants submit that Claim 18 likewise is patentable over Drummond in view of Devito.

For at least the reasons set forth above, Applicants respectfully request that the Section 103 rejection of Claims 1, 2, 9-13, 17, and 18 be withdrawn.

The rejection of Claim 3 under 35 U.S.C. 103(a) as being unpatentable over Drummond in view of Devito and further in view of U.S. Patent Application Publication 2003/0153823 to Geiser is respectfully traversed.

Drummond and Devito are described above. Geiser is cited for disclosing that the long axis of a heart can include the aorta and the atrium as well as the ventricle. Notably, Geiser does not describe nor suggest selecting an imaging exam configured to produce a 3D dataset representing at least one portion of the heart during at least one phase, and generating, by a processor, a volume of a ventricle of the heart based on the imaging exam selected.

Claim 3 depends from Claim 1, which is recited above.

None of Drummond, Devito, and Geiser, considered alone or in combination, describes or suggests a method as is recited in Claim 1. More specifically, none of Drummond, Devito, and Geiser, considered alone or in combination, describes or suggests a method including selecting an imaging exam configured to produce a 3D dataset representing at least one portion of a heart during at least one phase, and generating, by a processor, a volume of a ventricle of the heart based on the imaging exam selected. Rather, Drummond describes a post-processing algorithm that determines an image of a phase of the cardiac cycle representative of the end diastole and/or end systole; Devito describes a method of identifying a long axis of a left ventricle, and Geiser is cited for disclosing that the long axis of a heart can include the aorta and the atrium as well as the ventricle. Accordingly, Applicants submit that Claim 1 is patentable over Drummond in view of Devito and further in view of Geiser.

Claim 3 depends from independent Claim 1. When the recitations of Claim 3 are considered in combination with the recitations of Claim 1, Applicants submit that Claim 3 likewise is patentable over Drummond in view of Devito and further in view of Geiser.

For at least the reasons set forth above, Applicants respectfully request that the Section 103 rejection of Claim 3 be withdrawn.

The rejection of Claims 4-8, 14-16, 19, and 20 under 35 U.S.C. 103(a) as being unpatentable over Drummond in view of Devito and further in view of U.S. Patent 6,217,520 to He is respectfully traversed.

Drummond and Devito are described above. He is cited for describing that images can be taken at an end of a diastole period which would be close to 75% of an R to R interval. He is also cited for disclosing that an axis of inertia can be used to estimate a long axis. Notably, He does not describe nor suggest selecting an imaging exam configured to produce a 3D dataset representing at least one portion of the heart during at least one phase, and generating, by a processor, a volume of a ventricle of the heart based on the imaging exam selected.

Claims 4-8 depend from Claim 1, which is recited above.

None of Drummond, Devito, and He, considered alone or in combination, describes or suggests a method as is recited in Claim 1. More specifically, none of Drummond, Devito, and He, considered alone or in combination, describes or suggests a method including selecting an imaging exam configured to produce a 3D dataset representing at least one portion of a heart during at least one phase, and generating, by a processor, a volume of a ventricle of the heart based on the imaging exam selected. Rather, Drummond describes a post-processing algorithm that determines an image of a phase of the cardiac cycle representative of the end diastole and/or end systole, and Devito describes a method of identifying a long axis of a left ventricle. As set forth above, He does not make up for the deficiencies of Drummond and Devito. Accordingly, Applicants submit that Claim 1 is patentable over Drummond in view of Devito and further in view of He.

Claims 4-8 depend from independent Claim 1. When the recitations of Claims 4-8 are considered in combination with the recitations of Claim 1, Applicants submit that Claims 4-8 likewise are patentable over Drummond in view of Devito and further in view of He.

Claims 14-16 depend from Claim 12, which is recited above.

None of Drummond, Devito, and He, considered alone or in combination, describes or suggests a computer readable medium as is recited in Claim 12. More specifically, none of Drummond, Devito, and He, considered alone or in combination, describes or suggests a computer readable medium encoded with a program that is configured to instruct a computer to receive a selection representing an imaging exam configured to produce a 3D dataset representing at least one portion of a heart during at least one phase, and generate a volume of a ventricle of the heart based on the imaging exam selected. Rather, Drummond describes a post-processing algorithm that determines an image of a phase of the cardiac cycle representative of the end diastole and/or end systole, and Devito describes a method of identifying a long axis of a left ventricle. As set forth above, He does not make up for the deficiencies of Drummond and Devito. Accordingly, Applicants submit that Claim 12 is patentable over Drummond in view of Devito and further in view of He.

Claims 14-16 depend from independent Claim 12. When the recitations of Claims 14-16 are considered in combination with the recitations of Claim 12, Applicants submit that Claims 14-16 likewise are patentable over Drummond in view of Devito and further in view of He.

Claims 19 and 20 depend from Claim 17, which is recited above.

None of Drummond, Devito, and He, considered alone or in combination, describes or suggests a medical imaging apparatus as is recited in Claim 17. More specifically, none of Drummond, Devito, and He, considered alone or in combination, describes or suggests a medical imaging apparatus including a workstation configured to receive a selection representing an imaging exam configured to produce a 3D dataset representing at least one portion of a heart during at least one phase, and generate a volume of a ventricle of the heart based on the imaging exam selected. Rather, Drummond describes a post-processing algorithm that determines an image of a phase of the cardiac cycle representative of the end diastole and/or end systole, and Devito describes a method of identifying a long axis of a left ventricle. As set forth above, He does not make up for the deficiencies of Drummond and
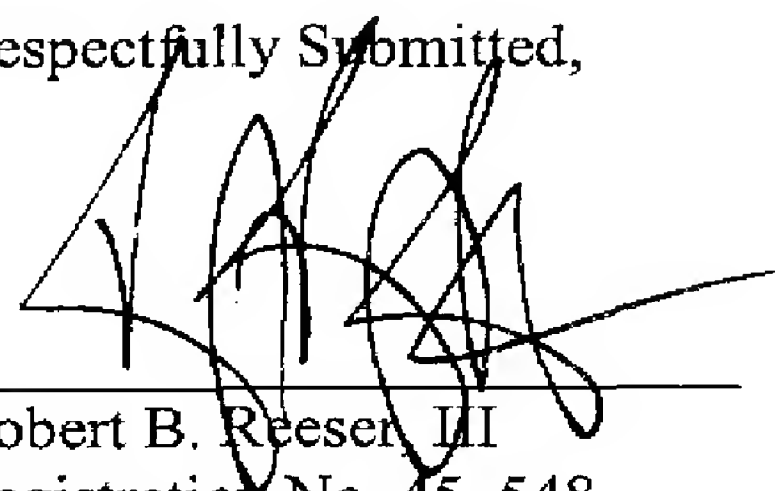
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Devito. Accordingly, Applicants submit that Claim 17 is patentable over Drummond in view of Devito and further in view of He.

Claims 19 and 20 depend from independent Claim 17. When the recitations of Claims 19 and 20 are considered in combination with the recitations of Claim 17, Applicants submit that Claims 19 and 20 likewise are patentable over Drummond in view of Devito and further in view of He.

For at least the reasons set forth above, Applicant respectfully request that the Section 103 rejection of Claims 4-8, 14-16, 19, and 20 be withdrawn.

In view of the foregoing amendment and remarks, all the claims now active in this application are believed to be in condition for allowance. Reconsideration and favorable action is respectfully solicited.

Respectfully Submitted,

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